UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

VOITH PAPER GMBH & CO. KG.,	)	
	)	
Plaintiff	)	
	)	
v.	)	Civil Action No. 07-226 (JJF)
	)	
JOHNSONFOILS, INC.,	)	
	)	
Defendant	)	

DECLARATION OF MICHAEL H. WALLER IN SUPPORTOF PLAINTIFF VOITH PAPER GMBH & CO. KG'S OPENING MARKMAN BRIEF

I, Michael H. Waller, declare that the following is true and correct:

Relevant Experience and Qualifications

1. I have prepared this Declaration in support of Plaintiff Voith Paper GMBH & Co. KG's Opening Markman Brief.

2. I am currently a Professor at Miami University in Ohio, in the Paper and Chemical Engineering Department. I have been a professor at Miami University since 1979. Prior to becoming a professor, I was a papermaking engineer. A copy of my Resumé is attached as Exhibit 1.

3. I have been retained by Voith to offer my opinion on the meaning of certain words and phrases used in the claims of U.S. Patents 5,718,805 and 5,972,168 (hereinafter referred to as the '805 and '168 patents, respectively, or collectively as the "Patents-in-suit").

4. I have no affiliation with Voith other than this matter.

5. In forming my opinions on the meanings of certain words and phrases appearing in the claims of the Patents-in-suit, I have reviewed the '805 and '168 patents and portions of the respective prosecution histories. I have also reviewed various dictionaries. I also rely upon my experience in the paper machine field.

6. As the '805 and '168 patents have the same Figures and specification, but different claims, for convenience I have cited only to the column and lines from the '805 patent.

7. It is my understanding that terms and phrases appearing in the claims of a patent are to be interpreted using their ordinary and accustomed meaning as would be understood by one of ordinary skill in the art in light of the claims, the specification, the prosecution history, and other extrinsic evidence (e.g., dictionaries and treatises).

8. I note that certain phrases recited in the claims of the Patents-in-suits use means-plus-function language. It is my understanding that construing means-plus-function language is a two-step process. The first step is to identify the claimed function. After identifying the claimed function, the second step is to identify the structure disclosed in the patent specification that performs the claimed function.

Background Concerning Paper Making Machines

9. A paper making machine is a machine used to manufacture paper. Paper making machines are very large and expensive. Today, a typical paper machine is longer than a football field. The cost of a complete paper making machine installation can exceed $500 million dollars.

10. Although paper making machines have a long history, the industry has yet to develop theoretical models which fully explain the paper forming process. Consequently, the paper making field is largely an empirical science in which innovations—even if resulting from novel rearrangements of mechanical paper forming components previously known—must be subject to extensive testing before achieving the status of an acceptable design.

11. The inventions of the Patents-in-suit relate to a section of the paper making machine especially critical to paper formation commonly known as the "wet end."

12. In the wet end, a fiber suspension made up of small fibers, mixed with water and other additives, is dewatered through a wire or fabric mesh to form a web. Mechanical elements such as rolls, shoes, and blades, contact the mesh and facilitate the forming process.

13. As water is drained from this fiber suspension through the mesh, fibers are pulled to the mesh surface in the direction of the draining water, forming a *web* consisting of the partially matted fibers and the remaining fiber suspension. After wet end dewatering, the web is transferred to other parts of the paper making machine for pressing, drying, and finishing.

14. The basic idea of dewatering a fiber suspension to form a web or sheet sounds simple enough, but, in practice, this simply stated process requires the solution of problems of immense complexity.

15. First, before even being applied to the wire mesh, the fiber suspension, typically 99% water, must be maintained in a very turbulent state to ensure uniformity.

This fiber suspension, even though mostly composed of water, typically contains *hundreds of thousands* of fibers per cubic inch.

16. The primary processing job of the wet end is to drain this fiber suspension *uniformly*, that is, without undesirable patterns or imperfections.

17. Complicating matters, the suspended fibers have a strong tendency to bind together to form undesirable clumps called "flocs." In a typical fiber suspension, such flocs form in a matter of milliseconds. Once formed, these flocs are very difficult to break apart, with the difficulty increasing by orders of magnitude as the amount of water remaining in the fiber suspension is reduced.

18. Because this phenomenon, called flocculation, cannot be completely eliminated, measures must be taken to reduce the impact of flocs on the final product by breaking the flocs apart—a process called defloccing—as they form. Thus, to obtain a high quality product, the wet end part of the paper former must, simultaneously, uniformly dewater the fiber suspension and agitate the remaining fiber suspension to reduce flocculation.

19. There are three basic types of wet end forming sections used in paper forming machines: The Fourdrinier, the Twin Wire Former, and the Hybrid Former. These basic wet end paper forming machine types are distinguished by the number and position of wire meshes used to dewater the fiber suspension.

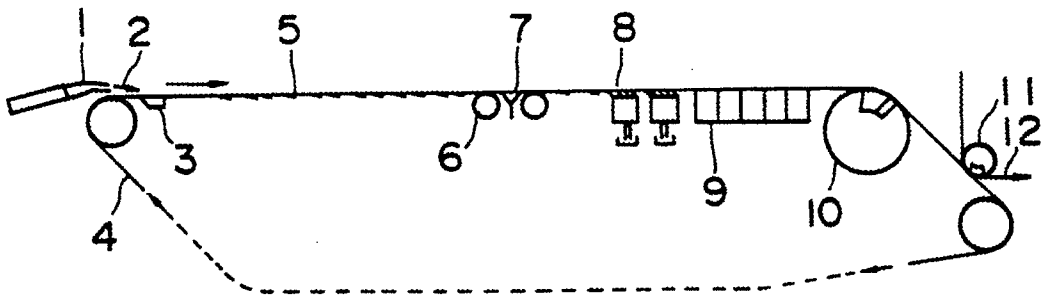
20. The Fourdrinier uses a single mesh.

21. The Twin Wire Former uses two meshes, with one positioned on each side of the web.

22. The hybrid former primarily consists of a single mesh, with another mesh positioned on the top side of the web for a portion of the wet end.

23. The Fourdrinier, shown below, utilizes a single horizontally oriented and continuously moving wire mesh.

FIG. 4(PRIOR ART)



24. As shown above, a jet of fiber suspension is discharged from a container, called a headbox, onto the surface of the mesh.

25. Water is removed from the fiber suspension through the mesh below by the force of gravity assisted by the action of strips, rolls and/or vacuum boxes.

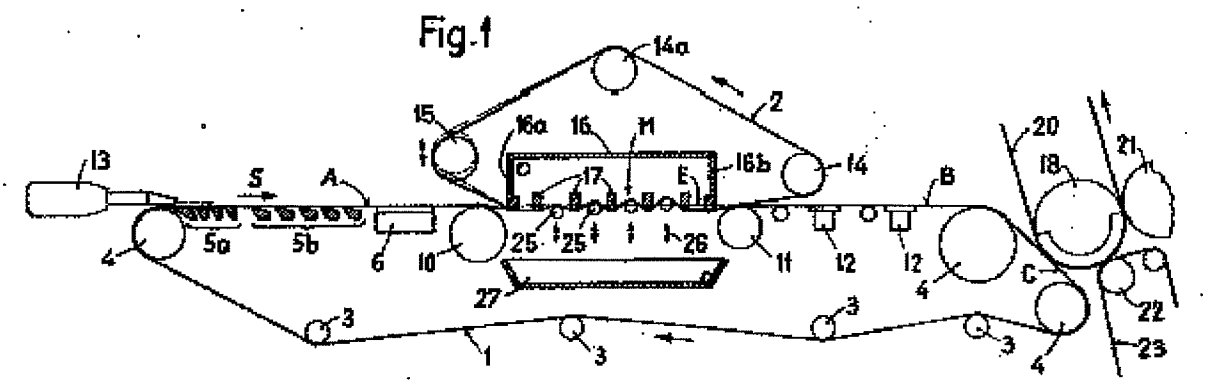
26. Although adequate for many applications and benefitting from its relative simple design compared to the alternatives, dewatering the fiber suspension from one side only results in a web with different surface characteristics on each side – called *two-sidedness*. These differences render the resulting web unsuitable for applications in which the uniformity of both sides of the paper is important.

27. In addition, dewatering from one side necessarily requires that the web formation process take longer than in paper formers able to simultaneously dewater the fiber suspension from both sides of the web. As explained above, with each passing second undesirable flocs form.

28. To make matters worse, the single wire drainage model of the Fourdrinier provided limited opportunity to agitate and defloc the fiber suspension during web formation.

29. For applications in which the Fourdrinier's problems of flocculation and web two-sidedness were unacceptable, a modified Fourdrinier design, called a hybrid former, shown below, was developed.

Fig.1



30. In a hybrid former, as in the Fourdrinier, the fiber suspension is discharged onto a single wire mesh and is dewatered through the action of gravity in conjunction with various strips, rolls, and vacuum boxes.

31. Unlike the Fourdrinier, however, the hybrid former has a region in which a second wire mesh, attached to a component called a top former, is positioned above the web. In the part of the wet end containing the top former, the web is simultaneously dewatered from above and from below. As a result, the time

needed for dewatering, as well as the two-sidedness of the web, are reduced to some extent.

32. In a Twin Wire Former, the entire web formation process is performed by simultaneously dewatering the fiber suspension from both sides. As shown below, in a Twin Wire Former the entire wet end forming region is bounded above and below by a wire mesh.

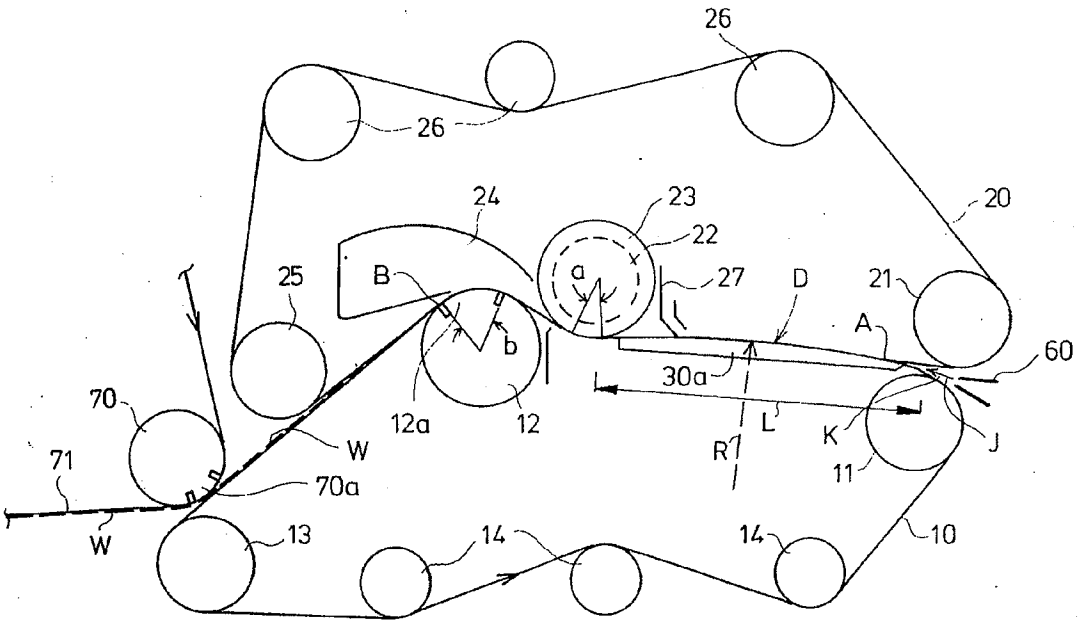


FIG.1

33. As a result, the time needed to dewater the web, as well as two-sidedness, is reduced yet further from the levels possible with either the Fourdrinier or the Hybrid Former.

34. On the down side, because of the absence of a single wire predrainage zone, the Twin Wire Former subjects the forming web to high stress at the very beginning of web formation, risking damage to the web.

35. Despite the comparative reduction in web formation time, flocculation, and sheet two-sidedness over the Fourdrinier and the Hybrid Former, these problems persisted.

36. As the demands on paper forming machines, such as increased production speed and quality, increased, once widely adopted paper forming machine designs became unacceptable.

37. As disclosed in the Patents-in-suit:

> [i]t has been attempted for decades with twin-wire formers of the known type to produce fiber webs (in particular, paper webs) of the highest possible quality with relatively high operating speeds. Due to the forming of the web between two wires, the result, in particular, is obtained that the final fiber web has substantially the same properties on both sides (little "two-sidedness"). However, it is difficult to obtain as uniform as possible a distribution of the fibers in the final fiber web.
>
> '805 patent, col. 1:45-53.

38. The Patents-in-suit further disclose that it had been

> difficult to obtain a good 'formation' since while the web is formed, there is always the danger that fibers will agglomerate and form flocculations. Therefore, it is attempted to form a jet of pulp slurry which pulp slurry is as free as possible of flocculations in the headbox (for instance, by means of a turbulence producer). It is, furthermore, endeavored so to influence the drainage of the fiber suspension during the web-forming that 'reflocculation' is avoided as far as possible or that, after possible flocculation, a 'deflocculation' (*i.e.* a breaking up of the flocculations) takes place.
>
> '805 patent, col. 1:53-63.

The Invention

39. To address the aforementioned problems in prior art Twin Wire Formers—problems that had persisted in the paper making industry for decades—Voith invented a novel Twin Wire Former that dramatically reduces the incidence of flocs in the web

during formation as well as undesirable web two-sidedness, even under the demands of modern production quality and speed requirements.

40. As disclosed in the Patents-in-suit, among other innovations, Voith discovered that introducing resiliently mounted strips, or blades, in the claimed configuration, effectively reduced flocculation while, at the same time, maintaining relatively constant pressure in the fiber suspension and, thereby, facilitating proper web formation.

41. This innovation was accomplished despite the failure of others in the paper making industry to discover Voith's novel combination, and despite the long felt need to improve Twin Wire Formers.

42. Voith's invention is all the more remarkable considering that the dramatic improvement was achieved using components which, though employed in disparate paper forming applications, were never, before the teachings of the Patents-in-suit, known to achieve, in combination, the long sought improvements. A more detailed description of Voith's invention as described in the Patents-in-suit follows.

43. As with Twin Wire Formers generally, Voith's novel Twin Wire Former utilizes two opposing wire meshes to form a web from a fiber suspension. The "wires" referred to in the Patents-in-suit are actually mesh belts, usually made of fabric.

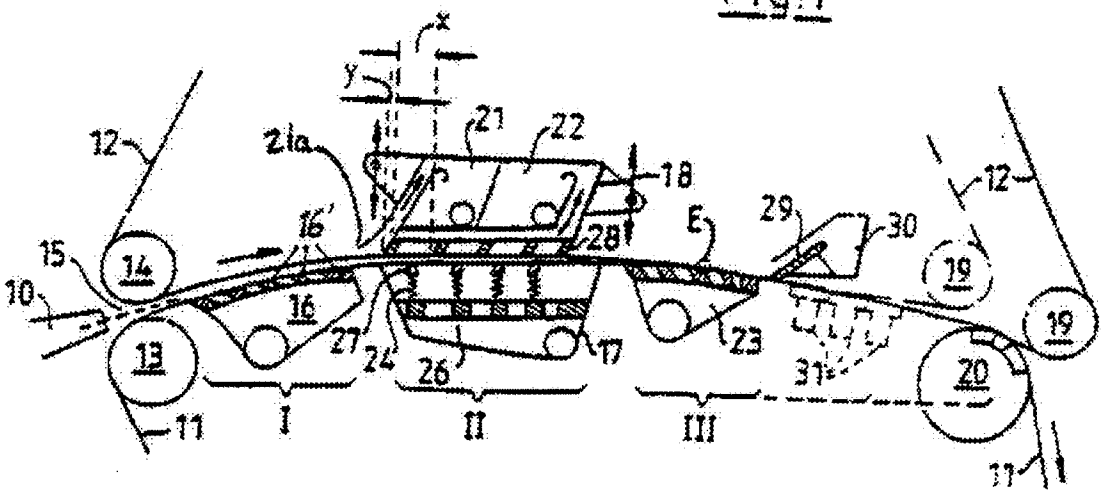
44. During web formation, each mesh travels in an endless, *i.e.* closed, loop. At the beginning of, or entrance to, the twin-wire zone, the two wire meshes form a wedge shaped entrance slot.

45. A headbox is used to discharge the fiber suspension, also referred to as "pulp slurry" or "stock," into the twin wire zone. Prior to discharge, the headbox maintains the fiber suspension in a turbulent state in order to inhibit flocculation. The fiber suspension

is discharged from the headbox onto the wire meshes into the wedge shaped slot. The two wire meshes thereafter travel together through the twin wire forming zone.

46. Fig. 1 of the '805 patent and the '168 patent, reproduced below, shows an embodiment of components, described in more detail below, which further comprise the invention.

Fig.1



47. To form the web, water is removed from the fiber suspension as it travels between and along the path of the wires. As water is removed through the two meshes, fibers collect in a mat against each mesh, leaving a relatively liquid fiber suspension center.

48. Because this liquid center persists during much of the web formation process, it is a fertile ground for the formation of undesirable flocs, which, as explained above, may take only milliseconds to form.

49. An important aspect of the invention is to maintain turbulence in this liquid center of the forming web while reducing the risk that the partially formed web is broken. As described in more detail below, a specific combination of resiliently mounted and rigidly mounted strips or blades contributes to accomplishing this result.

50. At the end of the twin wire zone, the opposing twin wire meshes separate and one of the meshes carries the formed web through the next processing component of the paper making machine for pressing, drying, and finishing.

51. To practice the invention, the twin wire formers claimed in the patents-in-suit are constrained to include at least some drainage and forming elements positioned relative to one another in a specified way. Unlike the hybrid former and the Fourdrinier described above, the invention precludes the use of a single-wire pre-drainage zone. As explained above, any substantial single wire predrainage is likely to result in undesirable web two-sidedness and increased flocculation. Thus, another important aspect of the invention is that the web formation begins in the twin-wire zone.

52. To illustrate how the above described aspects of the invention are realized, the following provides a more detailed description of a preferred embodiment. As described above, in the beginning of the twin-wire zone, the fiber suspension is discharged from the headbox onto the two wire meshes at the wedge shaped entrance slot.

53. At least one of the wire meshes passes over at least one drainage element in order to partially dewater the fiber suspension and begin the formation of the web.

54. In a preferred embodiment, this drainage element is curved, *e.g.*, a rotating forming cylinder or a (stationary) curved forming shoe. Additional drainage elements may also be present in the beginning of the twin-wire zone.

55. Following the wedge shaped entrance slot and initial drainage element(s), the invention includes a plurality of drainage strips (blades) that contact each wire mesh in an offset non-opposing relationship. These blades contact the wire mesh at points along the mesh path that are different from any blade in contact with an opposite wire mesh. The

drainage strips (blades) further remove water from the web by stripping water from the surface of the passing wire mesh.

56. In addition to providing intensive drainage, these blades also inhibit the formation of flocs in the liquid center of the partially formed web. This is achieved by imparting a slight deflection of the wires so that turbulence is constantly produced in the still liquid part of the web. '805 patent, col. 5:19-24.

57. Importantly, at least one of the drainage strips on one side of the wire meshes is resiliently supported while at least one of the drainage strips on the other side is rigidly supported. As described in the specification, the use of resiliently supported blades allows for the blade to temporarily move in response to changes in pressure of the fiber suspension, thus maintaining a relatively constant forming pressure and avoiding undesirable damage to the partially formed web. '805 Patent, col. 7:16-21.

58. As explained in the patent:

> Due to the resilient supporting of the lower strips **57**, the adjustment, once effected, is insensitive to changes in the quantity or quality of pulp, so that no backing up takes place in front of the strips and, nevertheless, an effective introduction of turbulence forces into the fiber suspension takes place.

Id.

59. The actual number of drainage strips on each side of the wires can be varied. '805 patent, col. 7:60-65; *see also* Figs. 1-5, elements 27, 28, 50, 57, 58.

60. After the drainage strips there may be one or more additional drainage elements. *See* Figs. 1-5, elements 23, 29, 31, 45.

61. As explained in the Patents-in-suit, a paper making machine containing at least the elements as claimed produces improved quality paper, *i.e.*, with reduced flocculation, and at desirably high speed.

62. During the prosecution of U.S. Patent No. 5,389,206, a grandparent of the '805 patent, the applicants explained that the elements which make up the invention were known in the prior art, and that it was the claimed combination of elements which was new and patentable:

> applicants are not claiming that any of the specific features are new. What applicants are claiming however is that they are the first to have combined these features ... and that such combination provide unforeseeable improvements in the resultant product, to wit, the combination ... results in extremely high increase in quality of the finished fiber web while at the same time being insensitive to changes in the amount of suspension fed and to changes in the drainage behavior of the fiber suspension. Thus it is possible to obtain both a high increase in quality with respect to the formation and also good values with regard to the retention of fillers and fines.

'206 patent prosecution history, Amendment dated November 19, 1992, p. 9.

63. The patents-in-suit also disclose that the invention relates to a combination of known features:

> The inventors have found that a combination of known features, namely:
>
> A. Twin-wire former without a single-wire pre-drainage zone or at least without a single-wire pre-drainage zone of any substantial length such as to cause any appreciable pre-drainage
>
> B. Start of the drainage in the twin-wire zone at a preferably curved drainage element, for instance on a rotating forming cylinder or, even better, on a curved stationary forming shoe

> C. Further drainage in the twin-wire zone between strips which are arranged along a "zig-zag" line, the strips which rest against the one wire belt being resiliently supported.
>
> leads to an extremely high increase in the quality of the finished fiber web, so that it satisfies even the highest requirements.
>
> '805 patent, col. 3:1-17.

64. As explained by the applicants, although each feature used in the claimed combination had been used in disparate paper forming applications, prior to the Voith's invention, despite intense pressure to improve the production quality and production speed of paper produced by Twin Formers over the course of decades, no one had discovered the claimed combination or its dramatic properties. *See, e.g.*, '805 patent, col. 1:45-63; 2:44-45.

Claim Terms

65. I have read the claims of the '805 and '168 patents and understand all the terms recited therein.

66. I have been asked how a person of ordinary skill in the art would have understood certain claim terms. A person of ordinary skill in the art would have understood the claim terms in accordance with their ordinary and accustomed meanings. The ordinary and accustomed meaning of each claim term is consistent with the words of the claims themselves, the specification, the prosecution history, and dictionaries relating to the paper making machine art.

67. In the following paragraphs, I have interpreted the claim terms in accordance with their ordinary and accustomed meanings.

68. Twin-wire former: A twin-wire former is a paper forming machine in which the web is formed between two moving "wires." A twin wire former is distinguished from single wire formers and hybrid formers.

69. Wire: A wire in the context of a twin wire former is a mesh belt. The Patents-in-suit use the terms "wire" and "belt" together and interchangeably. *See* '805 patent, col 4:6-8, 17-18: "the two wire belts 11 and 12"; col. 4:39: "wire 12"; col. 4:55: "wire 11"; col. 2:63-67: "drainage strips against one belt are offset along the path of the wire belts with respect to the drainage strips against the other belt, providing a zig zag or staggered array, and the drainage strips against at least one of the belts are resiliently supported." Consistent with the specification of the Patents-in-suit, The Handbook of Pulp and Paper Terminology defines the term "wire" as an endless belt of woven wire cloth for the drainage of stock and forming a fiber web. *See* Gary A. Smook, *HANDBOOK OF PULP & PAPER TERMINOLOGY*, 1990, p. 206 (Exhibit 2). In current practice, few metallic wires are used, but the term is usually applied to synthetic forming fabrics.

70. Web: A web is a partially dewatered fiber suspension. Consistent with the specification of the Patents-in-suit, the Handbook of Pulp & Paper Terminology states that the term web is applied to the full width of the paper sheet in the process of being formed, pressed, dried, finished or converted. *See* Gary A. Smook, *HANDBOOK OF PULP & PAPER TERMINOLOGY*, 1990, p. 205 (Exhibit 2).

71. Fiber suspension: A fiber suspension is a mixture of pulp fiber, water and additives. The fiber suspension is also commonly referred to as "stock" or "pulp

slurry." *See* '805 patent, col. 1:1-3; col. 1:27-28; col. 1:32-33. Consistent with the specification of the Patents-in-suit, the *Pulp & Paper Dictionary* defines "stock," a synonym for fiber suspension, as the fibrous mixture in a paper mill which is ready to make into paper. John R. Levine, *Pulp & Paper Dictionary,* 1986, 1992, p. 413 (Exhibit 3). The fiber suspension may consist of one or more types of beaten or refined pulps, with or without suitable fillers, dyes, additives, and other chemicals. *Id.*

72. Means for directing the wire belts: The "means for directing the wire belts" is a means plus function limitation. The recited function is "directing the wire belts." The structures disclosed in the specification which direct the wire belts include rolls, shoes, strips, and other structures which determine the path the belts travel. *See* '805 patent, Figs. 1-5.

73. Twin wire zone: The twin wire zone is where web formation occurs in a twin wire former.

74. Single wire predrainage zone: A single wire predrainage zone is the part of a single wire former or hybrid former in which the web is partially formed initially only in a lower layer of the fiber suspension while the upper layer remains liquid. '805 patent, col. 3:44-48. The twin wire former claimed in the Patents-in-suit does not have a single wire predrainage zone. '805 patent, col. 3:3-6; col. 8:11-12 (describing the invention as a twin wire former with "neither wire belt defining a predrainage zone").

75. First section: The first forming section of a twin wire former is where web formation begins.

76. Drainage element: An element which removes water from the fiber suspension or web. Examples of drainage elements disclosed in the specification include rolls, suction boxes, shoes and strips. *See, e.g.,* '805 patent, col. 3:7-10 ("Start of the drainage in the twin-wire zone at a preferably curved drainage element, for instance on a rotating forming cylinder or, even better, on a curved stationary forming shoe"); col. 5:16-18 ("two drainage boxes 17 and 18 with the alternately resiliently and firmly supported ledge strips 27 and 28."); col. 1:42-44 ("in a third section of the twin-wire zone there are a plurality of stationary drainage elements developed as flat suction boxes.").

77. Means for supporting the belts for forming a wedge shaped entrance slot: This element is a means plus function limitation. The recited function of this limitation is "forming a wedge shaped entrance slot." The structures disclosed in the specification for supporting the belts (wires) to form a wedge-shaped entrance slot are the two rolls at the start of the twin wire former. *See* '805 patent, Figs. 1-5; col. 4:4-6.

78. Wedge shaped entrance slot: The wedge shaped entrance slot is the wedge-shaped area between the two wires at the start of the twin wire zone where the two wires approach each other. S*ee, e.g.* '805 patent, col. 4:1-6 ("The endless wire belts (lower wire 11 and upper wire 12), shown only in part, travel in the direct vicinity of a headbox 10 over, in each case, a breast roll 13 and 14 respectively, so that the two wire belts together form a wedge-shaped entry slot 15 at the start of the twin-wire zone."); *see also* Figs. 1-5.

79. Headbox: A container at the beginning of the twin wire former which discharges the fiber suspension onto the wires. *See, e.g.,* '805 patent, col. 1:29-32.

80. Second section: The forming section after the first forming section of a twin wire former.

81. Drainage strips: A drainage strip is a blade which contacts the wire. '805 patent, col. 4:20-28, 37-38 ("The strips scrape the water from the wires.")

82. Offset and in a non-opposing relationship: Positioned so that the contact points of the blades on the wire do not oppose one another, *e.g.,* positioned in a zig-zag or staggered array. *See, e.g.,* 805 patent, col. 2:63-66.

83. Support means for resiliently supporting: The "support means for resiliently supporting" is a means plus function limitation. The recited function is "resiliently supporting." The structures disclosed in the specification for resiliently supporting the blades are springs and pneumatic pressure cushions. *See, e.g.,* '805 patent, col. 4:19-26.

84. Means for collecting the water: The "means for collecting the water" is a means plus function limitation. The recited function is "collecting water." The structures disclosed in the specification for collecting water include water-collection containers and channels. *See, e.g.,* '805 patent, col. 6:25-26 ("Further elements of the twin-wire former shown in Fig. 2 are water-collection containers 41, 42 and 43."); '805 patent col. 4:44-47 ("Accordingly, a vertical channel 21a is positioned in front of the first upper strip 28 to carry away or collect the water scraped off by the first strip 28").

85. Third section: The forming section after the second forming section of a twin wire former.

86. Roll: A rotating, cylindrically shaped, solid or hollow structure. This definition is consistent with the specification and the understanding of one of skill in the art. *See* John R. Levine, *Pulp & Paper Dictionary,* 1986, 1992, pp. 372-73 (Exhibit 3). Examples of rolls disclosed in the specification are breast rolls(col. 4:4), guide rolls (col. 3:51, col. 5:12), suction rolls (col. 5:12), and forming rolls (col. 5:42).

87. Endless loop: A continuous wire forming a closed loop. *See* '805 patent, Figs. 4 and 5 showing wire 12 in an endless loop.

88. Means for supplying a vacuum: The "means for supplying a vacuum" is a means plus function limitation. The recited function is "supplying a vacuum." The structures disclosed in the specification for supplying a vacuum is a chamber which applies a vacuum. *See e.g.,* vacuum chamber 51. '805 patent, Fig. 4 and col. 6:53.

89. Resiliently supported: The term "resiliently supported" means supported by flexible structures such as springs, pneumatic pressure cushions, or equivalent structures. The specification of the Patents-in-suit discloses that the resiliently supported strips are supported by springs or pneumatic pressure cushions. *See, e.g.,* '805 patent, col. 4:19-26; col. 7:6-8.

90. Rigidly supported: The term "rigidly supported" means firmly or non- resiliently supported. This definition is consistent with the specification of the Patents-in-suit and the understanding of one of ordinary skill in the art. *See* '805 patent, col. 5:17-34.

91. Dewatering element: A term "dewatering element" means an element which removes water.

92. Suction roll: A roll which includes suction to remove water. *See, e.g.,* '805 patent, suction roll 20 in Fig. 1, col. 5:11-14.

93. Forming roll: A forming roll is a roll used to form the web. The Patents-in-suit disclose that a forming roll may be a suction roll. *See, e.g.,* '805 patent, forming roll 40 in Fig. 2, col. 5:42; col. 6:20-21.

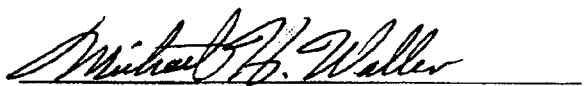
94. Forming shoe: A stationary drainage element which removes water. *See, e.g.,* '805 patent, Fig. 1 (element 16), col. 3:8-10. The Patents-in-suit disclose that the forming shoe may be curved or straight. '805 patent, col. 4:13-15.

Person of Ordinary Skill in the Art

95. Based upon my experience, I believe a person of ordinary skill in the art paper making machines as of 1989 was someone with an engineering degree and 1-3 years of experience working with paper making machines.

I, Michael H. Waller, declare under penalty of perjury that the foregoing is true and correct.

Date: January 16, 2008



Michael H. Waller

CERTIFICATE OF SERVICE

I, Adam W. Poff, hereby certify that on January 16, 2008, I caused to be electronically filed a true and correct copy of the foregoing document with the Clerk of the Court using CM/ECF, which will send notification that such filing is available for viewing and downloading to the following counsel of record:

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I further certify that on January 16, 2008, I caused a copy of the foregoing document to be served by hand delivery on the above-listed counsel of record and on the following non-registered participants in the manner indicated:

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Exhibit 1

RESUMÉ

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2007

EDUCATION:

BSME	Rensselaer Polytechnic Institute	1963
SM	Massachusetts Institute of Technology	1964
ME	(Professional Mechanical Engineer) MIT	1966

SUMMARY OF PROFESSIONAL EXPERIENCE:

1979 - Present: Professor in the Paper and Chemical Engineering Department at Miami University. (Previously Paper Science and Engineering).

1986: Lecturer in the Paper Science Department, University of Manchester Institute of Science and Technology, Manchester, England.

1966-1979: The Procter & Gamble Company. A variety of administrative and technical assignments. Named the Senior Engineer for Papermaking in 1978.

1966-1968: Captain, US Army. Executive Officer, Development & Proof Service, Aberdeen Proving Ground, MD. On leave from Procter & Gamble.

DETAILED EXPERIENCE:

1979-Present: Faculty member at Miami University.

Responsible for course presentations in the general areas of chemical engineering, papermaking and process control. Have presented specific courses in material balances, fluid mechanics, heat and mass transfer, papermaking, stoichiometry, instrumentation, process control, paper physics and statistics.

Instituted the Process Control Laboratory, and assisted in development of the Chemical Engineering Laboratory and courses. Author of 50 journal articles and one book. Presented a number of papers at technical meetings and short courses at a variety of locations. Have reviewed more than 75 papers for presentation at technical meetings or publication in technical journals.

Consultant to the industry in the area of papermaking processes, sensors and equipment.
See page 3 for detailed list.

PROCTER & GAMBLE EXPERIENCE:

Summary: Activities from 1971 onward were concerned exclusively with papermaking and the design, start-up, and trouble-shooting of papermaking equipment. Member of the start-up team of six tissue paper machines. Responsible for the process and control system design of the drying section of 14 tissue paper machines.

Senior Engineer for Papermaking, 1978. Activities centered around managing the development of papermaking equipment and processes from prototype concept to full-scale production. Managed all layered headbox development and in charge of twin-wire/wet end development for #3 & #4 Albany, GA paper machines. In-company consultant on all areas of applied papermaking.

Section Head for Papermaking Technology, 1975, Group Leader for Papermaking Technology, 1974 and Engineer, Papermaking Technology Group, 1973. Concerned with development of new tissue papermaking equipment, sensors and processes in laboratory and production environments, including feasibility and energy audit studies of existing paper machines. Member of #1 Albany, GA startup team, technical engineer in charge of Oxnard, CA wet end and dryer sections startup, and in charge of #14 Green Bay twin-wire rebuild study. Design engineer for the Pampers Scrap Recovery System in Cheboygan, MI.

Technical Engineer, 5/6M Paper Machines, Mehoopany, PA, 1972. Part of on-site staff for the Mehoopany capacity increase.

Papermaking Engineer, Engineering Division, 1971. Performed general adaptation, improvement and capacity increase studies for many of P&G's paper machines. Developed computer simulation models for stock suspension flows, vacuum dewatering and drying profiling. Developed the high-temperature dew-point sensor.

Development Engineer, Research & Development Department, Measurement & Control Section, 1968. Stability and sensor analyses of several P & G processes, including blow-through paper drying, Pringles chip cooking, synthetic detergent spraying and non-woven filament spinning.

PROFESSIONAL ORGANIZATIONS:

Member - Technical Association of the Pulp and Paper Industry
Member of Editorial Review Board for Tappi Journal.
Senior member - International Society for Measurement and Control (ISA)
Chairman of Education Sec., Pulp and Paper Industry Division.
Member of Editorial Advisory Board for ISA Transactions.
Member – Pulp and Paper Technical Association of Canada
Member of Paper Review Committee for Pulp and Paper Canada and Journal of Pulp and Paper Science.

AWARDS:

ISA Fellow, 2005; Life Senior Member, 2006
Industry Partnership Award, PSE Foundation, 2005
Miami University Honored Professor for Teaching, 2002
ISA Best Paper Award, 1997
Outstanding Teacher of Miami University, 1996
Member of Sigma Xi, Scientific Research Honorary

CONSULTING ACTIVITY:

Most recent: Involvement, topic and company, where appropriate.
Date. (Reverse chronological order.)

Technical expert witness for a case involving papermaking patent infringement, 2005-2006.
Technical expert witness for a case involving misappropriation of trade secrets, 2003-2004.
Technical expert witness for personal injury case involving papermaking equipment, 2002.
Technical expert witness for patent infringement case involving papermaking sensors, 2001.
Drying and temperature measurement study for moulded pulp application, 2001.
Marketing study and technological analysis of chemicals for papermaking water system chemistry and electrical charge control for chemical company, 2000.
Consultant to Harris Group for capacity increase of wet crepe paper machine, 2000.
Analysis of fiber deinking plant and paper machine water system at Tree-Free Fiber Co., Augusta, ME for Atlantic Paper and Foil, 1999.
Consultant to major tissue manufacturer for the design of a new paper machine, 1999.
Evaluation of spraying technology for softness enhancers for Union Carbide, 1998.
Consultant to tissue manufacturer for technology pertaining to softness development, 1998.
Member of design review team for a new Mexican tissue paper machine for NLK, 1998.
Technical expert witness for patent infringement case involving calender stack profiling equipment, 1997.
Consultant to tissue manufacturer for drying analyses of four paper machines, 1997.
Technical expert witness in a personal injury case involving papermaking equipment, 1996.
Technical expert witness for a patent infringement case involving the pumping of high consistency stock for Ahlstrom/ Kamyr Inc, 1991 through 1996.
A drying analysis, debottle-necking study and development of computer simulations for a capacity increase for a major U.S. tissue manufacturer, 1995.
Analysis of thru-drying paper making process for a major tissue manufacturer. Construction of computer simulation programs, 1994.
Technical expert witness in U.S. International Court of Trade in a case involving papermaking supercalenders for Sulzer Escher-Wyss, 1993.
Advisor to a major process control equipment manufacturer for the corporate restructuring of their U.S. sales and marketing organization, 1993.
Analysis of gasification technology for black liquor and paper/sludge for a manufacturer of recovery boilers, 1993.
Member of Pulp and Paper Industry Advisory Panel for ABB, 1992-1994.
A technical/marketing analysis of a potential paper machinery instrument for Applied American Technology Company, 1992.
Analysis of the U.S. process control equipment market for Frost & Sullivan, 1991.
Feasibility study of the rebuild and capacity increase of a tissue paper machine for Nystrom, Lee & Kobayashi, 1991.
Stock dewatering study for James River Corporation, 1990.
Analysis of wet end pinhole and sheet transfer problems for Yuen Foong Yu Paper Manufacturing Company, Taipei, Taiwan, 1989.
Preparation of advertising copy for nuclear gauging mass measurement for Ohmart, Inc, 1989.
Analysis of IR drying of paper for Jet Propulsion Lab, 1987.
Feasibility study for paper machine installation, Raymark Industries, Crawfordsville, IN, 1986.
Computer simulations of process control loops for Wiggins-Teape, Ltd, England, 1986.

Exhibit 2

HANDBOOK OF PULP & PAPER TERMINOLOGY

A Guide To Industrial and Technological Usage

by Gary A. Smook

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WATER JET SLITTER: Slitter which utilizes a high-velocity water jet to sever the web. This type of slitter is used selectively in the converting of tissue and board.

WATER-LOGGED: See FLOODED.

WATERMARK: Design formed among the fibers of the sheet as a result of the wet paper web coming into contact with the pattern of a dandy roll or marking roll. The paper becomes thinner and more translucent where the fibers are displaced by the raised design.

WATER VAPOR: Water in the gaseous state, especially when it is below the boiling point and diffused in air or other gases.

WEB: Term applied to the full width of the paper sheet in the process of being formed, pressed, dried, finished or converted. Syn. Sheet.

WEB HANDLING: Process of tracking the web, maintaining its tension at the proper level and keeping it wrinkle-free. Syn. Web Control.

WEB INSTABILITY: Any irregular behavior of an unsupported travelling web, including bouncing, floating and oscillation.

WEBSTER-TYPE FORMER: Former in which the sheet is formed between the external surface of a rotating cylinder and a forming fabric wrapping that cylinder. The cylinder may be solid or porous, and may be covered with fabric or felt. (Named for Canadian inventor.)

WEB SEPARATION: See SLITTING.

WEB TENSION: See SHEET TENSION.

WEB TRACTION: Pulling friction of the paper web as it moves over a roll or other surface.

WEB TRANSFER: See SHEET TRANSFER.

WEB WRINKLES: Out-of-plane deformations of the web that are transferred over rollers from one web span to the next.

WET BOX: Any vacuum-assisted drainage element for the fourdrinier that utilizes an interior seal leg. These low-vacuum elements produce up to 20 inches of water vacuum. Syn. Wet Suction Box, Forming Box.

WET BROKE: See BROKE.

WET BULB TEMPERATURE: Indicated temperature of a moving air stream as measured with a thermometer whose sensing element is covered with a wet wick. The wet bulb temperature along with the ambient temperature (dry bulb temperature) is used to determine the humidity and other psychrometric properties of air by reference to standard tables.

WET CREPING: Creping of a wet or partially dried paper web.

WET DRAW: Draw between sections at the wet end of the paper machine. See also DRAW.

WET END: That portion of the paper machine which includes the headbox, wire part, and press section.

WET-END ADDITIVES: Chemicals added to the papermaking furnish including internal additives and agents which serve as processing aids on the wet end. See also PAPERMAKING ADDITIVES.

WET-END BALANCE: Accounting of the distribution of stock and water inputs and outputs around the fourdrinier or other forming sections.

WET-END BARRING: Machine-direction grammage variation which takes place at relatively high frequencies above 10 Hz, due to wet-end hydraulics and mechanics including the phenomenon known as "wave amplification on the wire".

WET FELT: Designation correctly applied to any press felt, but more often applied to the felt used in the first press nip. See also FELT, PRESS FELT.

WET PACK: Process whereby paper is tub sized and then held in roll form for a certain length of time before it is dried.

WET ROLLING: Any pressing or smoothing operation carried out on the wet web.

WET-STRENGTH BROKE: Broke from wet-strength papermaking operations. Because of its high wet strength, the broke is difficult to repulp, and special techniques are usually employed depending on the particular type of wet strength treatment.

WETTING: Increasing the moisture content of paper; the opposite of drying. See also MOISTURE PICKUP, REHUMIDIFYING.

WETTING SHOWER: Arrangement of water sprays in the dry-end broke repulper which wet the sheet immediately to prevent flotation and allow the sheet to be quickly drawn into the vortex.

WET-UP: Adding water uniformly to a felt after installation or just prior to a startup.

WET WEB ADHESION: Adhesion between the wet web and any supporting surface, such as a forming fabric or press roll. The amount of adhesion depends on the characteristics of both the wet web and the surface. See also RELEASE PROPERTIES, PEELING ANGLE.

WET WEB SATURATION: Method of adding polymer solutions or dispersions (usually latex) to wet webs in the high grammage range from 250 to 1500 g/m². The pressed sheet is run through a tub of polymer (i.e., the saturation process) and then through a pair of squeeze rolls for redistribution and removal of excess polymer.

WHALES: Large air bubbles at the surface of a pulper which prevent submergence of a broke sheet.

WHIPPER: Roll equipped with extended bars, commonly used on multiply board machines to condition the felt by beating (in conjunction with showering of the felt).

WHITE WATER: General term for any stock filtrate or process water that contains fiber fines. On the papermachine, white water is produced during the forming and dewatering of the web. "Rich white water" contains a high concentration of fiber fines, while "lean white water" contains a low concentration. Syn. Back Water. Also see WIRE PIT WATER.

WHITE WATER CONSISTENCY PROFILE: Graph showing white consistency after each drainage element along the fourdrinier.

WHITE WATER LOOP: Paper machine process circuit in which white water is taken from a storage tank and utilized as stock dilution, and then subsequently separated from the stock and returned to the storage tank.

WHITE WATER SYSTEM: System of tanks, pumps and piping for handling all recirculated process water streams. A white water system is said to be "open" if a large proportion of the total white water flow leaves the system, and "closed" if only a small proportion leaves the system.

WIDENING: Usually refers to the treatment by which a felt or fabric is mechanically worked out to greater than normal operating width.

WIDE-NIP PRESS: Press in which the sheet runs through a wide nip formed by a rotating roll and a fixed concave support shoe. The shoe is continuously lubricated and acts as a slipbearing for a rubber blanket which runs between the shoe and the felt.

WIDTH (of a paper roll): Dimension of the web in the cross direction.

WINDAGE: Air carried along by a paper dryer fabric.

WINDER: Equipment that receives pape machine reels and breaks them down (by slittin and winding) into suitable size rolls that may b either sent directly to the customer or processe through additional coating, calendering or sheetin operations. See also TWO-DRUM WINDER.

WINDER SPECIFICATIONS: Misnomer refe ring to the specifications for the diameter and widt of rolls produced from the winder. The specifica tions may also include a range of roll hardness.

WINDER TENSION CONTROL: Control (web tension between the unwind stand and th winding drums. See also BRAKING.

WINDING: Process which changes a materi manufactured continuously from web form into ro form for further processing.

WINDING DRUMS: Pair of independentl driven drums on which the paper rolls are wound o a winder. The difference in speed between the tw rolls is used to control the roll structure. Syn. Be Rolls.

WINDUP STATION: That part of the winde which provides a means of winding up rolls of pap side-by-side on small-diameter cores. Syn. Windu Stand.

WIRE: Endless belt of woven wire cloth for th drainage of stock and forming of a fiber web. In cu rent practice, few metallic wires are used, but th term is often applied to synthetic forming fabric

WIRE CHANGE: Removal of a worn-out (defective forming fabric (or forming wire) an replacement with a new one.

WIRE LIFE: Service life of a forming fabric (forming wire.

WIRE LIFE EXTENDER: Corrosion inhibit which is added to the paper machine white wat system to extend the service life of a metal formin wire.

WIRE LOADING: Process of applying and inco porating a mineral or synthetic filler into the w web as it is being formed on the fourdrinier.

WIRE PART: Paper machine forming unit, alor with all ancillary equipment.

WIRE PIT: Rich white water silo equipped wi long, open supply channels, usually located unde neath the fourdrinier wire. Free-draining wat from the forming section of the wire falls onto cc lecting trays, which funnel the water into the cha nels. A relatively long period of channel flow is the desirable to release entrained air and dissipate tu bulence, before the wire pit water is recombine with the stock flow.

Exhibit 3

PULP&PAPER Dictionary

BY **John R. Lavigne**

TECHNICAL EDITING BY **Ken L. Patrick**

from the publishers of PULP & PAPER and PULP & PAPER INTERNATIONAL

A PULP & PAPER BOOK mf

To the pulp and paper industry in appreciation for providing me with the opportunity to be associated with people who have shared and made the pursuit of my career so enjoyable.

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RING GRINDER: A type of pulpwood grinder used to make groundwood pulp. The logs are fed to the grindstone surface by a chain-driven, ring-type chamber and set eccentric to the grindstone, whose speed determines the rate of feed.

RING MARK: (1) Watermark made on less expensive grades of paper using rubber rings with raised images or designs. (2) Paper defects appearing as cloudy rings or blotches, particularly on pigment-colored papers, caused by the bursting of bubbles formed while the web is on the paper machine wire.

RING POROUS: A characteristic of pulpwood logs from hardwood trees in which the annual spring growth rings are made up of large pores and vessels.

RING STIFFNESS: *See* RING CRUSH.

RING WATER: Dilution water injected in a number of locations around the periphery of pulp stock storage tanks and bleaching towers. It is injected just above the agitators and scraper arms to facilitate the removal of the pulp stock from the bottom by stock pumps.

RINGELMANN CHART: A chart of grey-shaded color standards used to evaluate the opacity and density of smoke in order not to produce excessive emissions.

RIPPLE FINISH: An undulating surface finish produced on paper by passing the paper between embossing rolls or by plating.

RISE TIME: The elapsed time required to achieve top operating temperature and pressure by steam-heating a batch-type digester in a pulp mill.

ROAD MAP PAPER: Long fiber paper made from chemical pulp. It has good printing and folding properties and is used for making up road and other types of maps.

ROD MILL: A defibering machine made up of a revolving, rugged, lined, metallic, horizontal drum, partially filled with iron rods. It was once used extensively by pulp and paper mills to refine pulp screenings by passing the stock from one end to the other.

ROE CHLORINATION NUMBER: A value determined by a pulp mill laboratory test on pulp to indicate the quantity of gaseous chlorine absorbed by a specified sample. It is a measure of its bleachability.

ROLL: (1) A continuous sheet of paper or paperboard wound up around a core or shaft, usually to specified diameter and width to best suit subsequent finishing and converting operations. (2) A rotating, cylindrically shaped, solid or hollow structure made from a variety of materials. It is normally used in a horizontal position to support or carry paper or other sheet

materials, such as felt, on a paper machine. They may be driven or rotated by the sheet they support, or they may be independently driven.

ROLL BOX: A small, vacuum suction box sometimes located just behind the breast roll on the wet end of a paper machine. It is used to remove air and water from the returning wire in order to aid in stabilizing the stock flow jet from the slice, and to minimize the tendency to form bubble marks in the sheet.

ROLL-COATED: A descriptive reference to paper that has been surface-coated in a type of coating operation which applies the coating material with a rubber applicator roll. The material is picked up in metered amounts from another feed roll.

ROLL COATER: Any type of paper-coating machine that uses cylindrical rolls to pick up, meter, and apply coating material to the surfaces of a paper sheet.

ROLL CONVEYORS: A pulp and paper mill materials moving system made up of a series of rollers with end bearings or loose wheels on spindles, spaced at regular intervals, and mounted on parallel supports.

ROLL CORE: A metal, wood, or convolute-wound fiber tube used to wind paper or paperboard for transporting and shipping.

ROLL CROWN: The surface curvature shape or diameter profile of the press and calender rolls to compensate for deflection in order to obtain a uniform nip pressure distribution across the full width through which the paper passes.

ROLL CURL: The curvature a sheet of paper assumes due to becoming set when wrapped into a roll around a core or shaft. Also referred to as *roll set* and *wrap curl*.

ROLL DOCTOR: A scraping device in the form of a thin blade in contact with and extending across the face of paper machine rolls, usually to keep the surface clean. Also called a *doctor* or *doctor blade*.

ROLL EDGE DAMAGE: A paper roll defect consisting of any damage occurring at the ends, such as nicks, cuts, and indentations.

ROLL END: A piece of circular paper or paperboard placed on the side end of a roll of paper (*roll head*) prepared for shipment. It is used to prevent damage to the edges. *See also* ROLL HEADING.

ROLL FINISHING: A paper mill operation in which paper rolls from the paper machine winder are sent through a series of handling steps. These steps range from removing their shafts, stripping the outer layers, mechanically conveying to automatic wrapping, crimping, heading, weighing, labeling, and printing, to final conveying to the shipping area.

and biochemical oxygen demand (BOD) by a controlled direct steam injection process.

STEAM TRAP: A device used to automatically drain condensate from steam systems such as found on dryers and heat exchangers.

STEAM TURBINE: A source of prime movement consisting of a series of blades on which steam jets are allowed to impinge in such a way that the action rotates a shaft on which they are mounted and which is connected to an electric generator, pump, or other machinery to be driven.

STEAMED MECHANICAL PULP: A brown-colored, unbleached, groundwood pulp made by steaming the pulpwood prior to grinding.

STEM FIBERS: Types of fibers that are obtained from the stems of plants, e.g., bamboo, bagasse, straw, or the main trunk of a tree.

STENCIL PAPER: High-strength type tissue paper made especially to be wax- or oil-treated. It is used as a base for conversion into master sheets for use on mimeographs and similar duplicating machines.

STICK: (1) A common name used in the wood preparation area of a pulp mill in reference to a pulpwood log. (2) A roll of paper wound up on a winder shaft after being made on a paper machine.

STICK MARK: *See* BACK MARK.

STICK OUT: A paper defect manifested as a partial irregular separation or rupture of the web. *See* PARTIAL MACHINE DIRECTION TENSION BURST.

STICKIES: Sticking conditions occurring on paper machines using secondary recycled fiber containing materials such as ink, tars, latex, adhesives, and other organic compounds. Also refers to the sticky materials.

STIFFNESS: That ability of paper or paperboard to withstand bending or crushing forces. Also called *rigidity*.

STOCK: (1) The fibrous mixture in a paper mill which is ready to make into paper. It may consist of one or more types of beaten or refined pulps, with or without suitable fillers, dyes, additives, and other chemicals. Also called *furnish* and *stuff*. (2) Paper suitable for a particular use, such as coating raw stock, milk bottle stock, tag stock, towel stock, etc.

STOCK AGITATOR: A type of equipment or method used to keep the fibers well-dispersed in a stock slurry storage vessel by the use of air or mechanical stirring action.

STOCK BLENDING: The process of mixing a variety of types of pulps, additives, dyes, and chemicals to make up a stock slurry satisfactory to meet